

APPENDIX D

TREE SURVEYS

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APRIL-MAY 2006

TREE CENSUS SUMMARY
Sunnyvale Industrial-to-Residential
(ITR) Project Site
Sunnyvale CA

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Introduction and Overview

David J. Powers & Associates is providing environmental review for the redevelopment of several parcels (130 acres) between Duane Avenue and Stewart Avenue in Sunnyvale, California. The project proposes to amend the City's General Plan Land Use Map to change the land use and zoning designation on the entire 130-acre site from *M-S (Industrial and Service)* to *Industrial-to-Residential (ITR)* in order to allow for the conversion and redevelopment of the site with residential uses. The project also includes two proposed specific residential development projects on portions of the overall site (the Riding Group and Taylor Woodrow projects). HortScience, Inc. was asked to prepare a Tree Census for the project.

This report provides the following information:

1. A census count of trees within the proposed project area. Trees over four (4) inches in diameter were counted.
2. General information on the health of trees, recorded by species.

Survey Methods

Trees were surveyed in February, 2006. The survey included trees greater than four (4) inches in diameter. The survey procedure consisted of the following steps:

1. Identifying the tree as to species;
2. Assigning each tree to a trunk diameter based size category: small (4"-11"), medium (12"-23"), and large (24" and greater).
3. Locating each tree within one of 16 numbered parcels (see Subarea Map).

Description of Trees

Two thousand two hundred sixty-five (2,265) trees were found in our census tally of trees four (4) inches and greater in trunk diameter. Fifty-seven (57) species were represented. A summary is provided in Table 1 (Page 2).

The sites where our census was performed were commercial office parks. The sites have variable ownership, and are assigned reference numbers. The location of the sites is shown in the Subarea Map in Attachments.

The trees were growing as landscape amenities as part of the landscaping, in most cases located in parking lot islands, planting strips along roadways, as border plantings along fences, and in groups near the office buildings.

Of the 57 species present, three (3) species dominated the population: raywood ash (314 trees), coast redwood (297 trees) and Bradford pear (272 trees). Together, these species account for 39% of the total number of trees.

Tree size was dominated by those in the small size category (4"-11" diameter), with 1,360 trees (60% of the population) in this category. This is reflective of the relative youth of the tree population, as the trees were planted during the development of these sites. Another factor in the dominance of small trees is that numerous species were used that are small in stature even when mature. Examples of this include Japanese maple, strawberry tree, red bud, Hollywood juniper, crepe myrtle, and crab apple.

The 797 medium size trees (12"-23" diameter) made up 35% of the population. These were dominated by evergreen ash, Canary island pine, and coast redwood.

The 108 large size trees (24" and greater in diameter) made up only 5% of the population. Over one-half of these (56 trees) were evergreen ash.

Table 1: Species and size distribution of census trees

Common Name	Scientific Name	Size Class			No. of Trees
		Small (4"-11")	Medium (12"-23")	Large (24">)	
Blackwood acacia	<i>Acacia melanoxylon</i>	13	5	0	18
Japanese maple	<i>Acer palmatum</i>	8	0	0	8
Red maple	<i>Acer rubrum</i>	3	0	0	3
Silk tree	<i>Albizia julibrissin</i>	11	5	0	16
White alder	<i>Alnus rhombifolia</i>	3	0	0	3
Strawberry tree	<i>Arbutus unedo</i>	17	5	0	22
European birch	<i>Betula pendula</i>	73	2	0	75
Deodar cedar	<i>Cedrus deodara</i>	3	4	1	8
Chinese hackberry	<i>Celtis sinensis</i>	4	0	0	4
Red bud	<i>Cercis sp.</i>	23	0	0	23
Red gum	<i>Eucalyptus camaldulensis</i>	1	6	4	11
Flowering gum	<i>Eucalyptus ficifolia</i>	0	1	0	1
Nichol's willow leaf peppermint	<i>Eucalyptus nicolai</i>	7	0	0	7
Silver dollar gum	<i>Eucalyptus polyanthemos</i>	1	2	5	8
Red ironbark	<i>Eucalyptus sideroxylon</i>	0	4	1	5
Raywood ash	<i>Fraxinus oxycarpa</i>	31	0	0	31
Evergreen ash	<i>Fraxinus uhdei</i>	53	205	56	314
Australian willow	<i>Geijera parvifolia</i>	1	5	0	6
Ginkgo	<i>Ginkgo biloba</i>	2	0	0	2
Kentucky coffee tree	<i>Gymnocladus dioica</i>	0	8	0	8
English walnut	<i>Juglans regia</i>	1	0	0	1
Hollywood juniper	<i>Juniperus chinensis</i>	2	2	0	4
Crepe myrtle	<i>Lagerstromia indica</i>	40	62	0	102
Grecian laurel	<i>Laurus nobilis</i>	6	0	0	6
Glossy privet	<i>Ligustrum lucidum</i>	7	13	2	22
Sweetgum	<i>Liquidambar styraciflua</i>	40	0	0	40
Tulip tree	<i>Liriodendron tulipifera</i>	23	7	1	31
Brisbane box	<i>Lophostemon confertus</i>	66	0	0	66
Southern magnolia	<i>Magnolia grandiflora</i>	23	5	0	28
Crab apple	<i>Malus floribunda</i>	1	0	0	1
European olive	<i>Olea europaea</i>	12	1	4	17
Photinia	<i>Photinia fraseri</i>	6	0	0	6
Colorado grn spruce	<i>Picea pungens</i>	11	0	0	11
Canary Island pine	<i>Pinus canariensis</i>	34	137	8	179
Aleppo pine	<i>Pinus halepensis</i>	0	39	0	39
Italian stone pine	<i>Pinus pinea</i>	0	6	4	10
Monterey pine	<i>Pinus radiata</i>	6	14	2	22
Japanese black pine	<i>Pinus thunbergiana</i>	1	0	0	1
Chinese pistache	<i>Pistachia chinensis</i>	54	5	0	59
London plane	<i>Platanus x acerifolia</i>	195	1	2	198
Fern pine	<i>Polocarpus gracilior</i>	9	0	0	9
Flowering plum	<i>Prunus cerasifera</i>	32	0	0	32
Flowering cherry	<i>Prunus serrulata</i>	34	0	0	34
Bradford pear	<i>Pyrus calleryana</i>	258	14	0	272
Evergreen pear	<i>Pyrus kawakamii</i>	20	1	0	21
Coast live oak	<i>Quercus agrifolia</i>	19	4	0	23
Holly oak	<i>Quercus ilex</i>	27	24	5	56
Red oak	<i>Quercus rubra</i>	4	0	0	4
Cork oak	<i>Quercus suber</i>	1	0	0	1
Southern live oak	<i>Quercus virginiana</i>	14	4	0	18
Italian buckthorn	<i>Rhamnus alaternus</i>	2	0	0	2
Black locust	<i>Robinia pseudoacacia</i>	12	0	0	12
Brazilian pepper	<i>Schinus terebinthifolius</i>	16	4	0	20
Coast redwood	<i>Sequoia sempervirens</i>	121	166	10	297
Carob	<i>Seratonia siliqua</i>	0	7	0	7
Chinese elm	<i>Ulmus parvifolia</i>	9	25	0	34
Mexican fan palm	<i>Washingtonia robusta</i>	0	4	3	7
Total		1360 60%	797 35%	108 5%	2,265 100%

Comments on the health and/or structure of the species represented with significant numbers:

Evergreen ash (314 trees)

They had a single trunk to a height of 5'-8', where three to six scaffold branches emerged. Most were in good health; a few had structural problems where scaffold branches were poorly attached. They develop large surface roots in maturity that often displace infrastructure such as sidewalks.

Coast redwood (297 trees)

The coast redwoods were generally in good health and typically perform well in irrigated landscapes. There were exceptions, where trees exhibited poor color foliage in Area 11, and the large tree in Area 10.

Bradford pear (272 trees)

Numerous scaffold branches emerged from a single trunk at a height of 6'-7'. These were generally in good health. The typical problem with this species is weakly attached scaffold branches. This was avoided in most cases by pruning to thin the number of scaffold branches.

London plane (198 trees)

In generally good health, the London planes had single trunks to a height of 5'-12' with multiple scaffold branches at that point. Leaf diseases can be a cosmetic problem, but don't usually diminish overall health.

Canary Island pine (179 trees)

The Canary Island pines were well structured, with a single trunk and uniform branching that is typical of the species. The health of the trees was variable, with many showing poor color (light green to yellow) foliage.

Crepe myrtle (102 trees)

These small-stature trees perform well in these commercial landscapes. Most were in good health. Most had single trunks to a height of 7' supporting a round crown. Some were multi-stemmed at ground level.

European birch (75 trees)

These were generally in fair to good health. Many were multi-stemmed at ground level, and some were infested with aphids.

Over one-half of the tree population belongs to these seven (7) species. The remaining 50 species have fewer trees, all with less than 3% of the population. Five species were represented by a single tree each.

Coast live oak was the only one of the 57 species that was native to the site. Of the 23 trees present, 19 were in the small size category (4"-11" diameter). The remaining four (4) were in the medium size category (12"-23" diameter). The coast live oaks were generally in poor health, with poor color foliage. They typically do not perform well in irrigated commercial landscape settings.

Sunnyvale's tree ordinance defines Protected Trees as those of 12" and greater in diameter. Our tree census indicates that 905 trees on the site meet that size criterion.

Trees on the site were generally in good condition, but a few species stood out as having uniformly poor condition. Those species include blackwood acacia, coast live oak, flowering gum, Nichol's willow-leaf peppermint, and red gum.

Suitability for Preservation

Before evaluating the impacts that will occur during development, it is important to consider the quality of the tree resource itself, and the potential for individual trees to function well over an extended length of time. Trees that are preserved on development sites must be carefully selected to make sure that they may survive development impacts, adapt to a new environment and perform well in the landscape.

Our goal is to identify trees that have the potential for long-term health, structural stability and longevity. For trees growing in open fields, away from areas where people and property are present, structural defects and/or poor health presents a low risk of damage or injury if they fail. However, we must be concerned about safety in use areas. Therefore, where development encroaches into existing plantings, we must consider their structural stability as well as their potential to grow and thrive in a new environment. Where development will not occur, the normal life cycles of decline, structural failure and death should be allowed to continue.

Evaluation of suitability for preservation considers several factors:

- **Tree health**
Healthy, vigorous trees are better able to tolerate impacts such as root injury, demolition of existing structures, changes in soil grade and moisture, and soil compaction than are non-vigorous trees.
- **Structural integrity**
Trees with significant amounts of wood decay and other structural defects that cannot be corrected are likely to fail. Such trees should not be preserved in areas where damage to people or property is likely.
- **Species response**
There is a wide variation in the response of individual species to construction impacts and changes in the environment. In our experience, for example, English walnut is sensitive to construction impacts, while Mexican fan palm is tolerant of site disturbance.
- **Tree age and longevity**
Old trees, while having significant emotional and aesthetic appeal, have limited physiological capacity to adjust to an altered environment. Young trees are better able to generate new tissue and respond to change.
- **Invasiveness**
Trees with the potential to invade an established forest, reproduce rapidly, and grow in sub-optimal environments are considered invasive. Species with these qualities may alter the function and aesthetics of the forest. None of the trees present on this site were particularly invasive.

Many of the trees included in our census would be moderate or good in suitability for preservation. Because of the likely grading requirements of constructing residential housing on the site, the location of trees will be the most important element in determining if may be preserved. Trees near the existing arterial streets will be the best candidates for preservation, where grading for buildings and trenching for utilities does not encroach too greatly on their roots.

Tree Preservation Guidelines

Certain trees will be designated for preservation based on their suitability for preservation and location relative to the development plan. Once those decisions have been made, the following recommendations will help reduce impacts to trees from development and maintain and improve their health and vitality through the clearing, grading and construction phases.

The goal of tree preservation is not merely tree survival during development but maintenance of tree health and beauty for many years. Trees retained on sites that are either subject to extensive injury during construction or are inadequately maintained become a liability rather than an asset. The response of individual trees will depend on the amount of excavation and grading, the care with which demolition is undertaken, and the construction methods. Coordinating any construction activity inside the Tree Protection Zone can minimize these impacts.

Design recommendations

1. For design purposes the **TREE PROTECTION ZONE** shall be defined at the edge of the dripline, except where driplines encroach on sidewalks or streets. No grading, excavation, construction or storage of materials shall occur within that zone. When trunks are accurately located and development plans refined, the Consulting Arborist will identify specific **TREE PROTECTION ZONES** for each tree.
2. No underground services including utilities, sub-drains, water or sewer shall be placed in the **TREE PROTECTION ZONE**.
3. **Tree Preservation Notes**, prepared by the Consulting Arborist, should be included on all plans.
4. Any herbicides placed under paving materials must be safe for use around trees and labeled for that use.
5. Irrigation systems must be designed so that no trenching will occur not within the **TREE PROTECTION ZONE**.


Pre-construction treatments and recommendations

1. The construction superintendent shall meet with the Consulting Arborist before beginning work to discuss work procedures and tree protection.
2. Fence trees to enclose the **TREE PROTECTION ZONE** (leaving space for pedestrian entrance) prior to demolition, grubbing or grading. Fences shall be 6 ft. chain link or equivalent as approved by consulting arborist. Fences are to remain until all grading and construction is completed.
3. Prune trees to clean the crowns and to provide clearance to structures, streets, and pathways. All pruning shall be completed by a Certified Arborist or Tree Worker and adhere to the *Best Management Practices for Pruning* of the International Society of Arboriculture.

Recommendations for tree protection during construction

1. No grading, construction, demolition or other work shall occur within the **TREE PROTECTION ZONE**. Any modifications must be approved and monitored by the Consulting Arborist.
2. Any root pruning required for construction purposes shall receive the prior approval of, and be supervised by, the Consulting Arborist.
3. Supplemental irrigation shall be applied as determined by the Consulting Arborist.
4. If injury should occur to any tree during construction, it should be evaluated as soon as possible by the Consulting Arborist so that appropriate treatments can be applied.
5. No excess soil, chemicals, debris, equipment or other materials shall be dumped or stored within the **TREE PROTECTION ZONE**.
6. Any additional tree pruning needed for clearance during construction must be performed by a Certified Arborist and not by construction personnel.
7. As trees withdraw water from the soil, expansive soils may shrink within the root area. Therefore, foundations, footings and pavements on expansive soils near trees should be designed to withstand differential displacement.

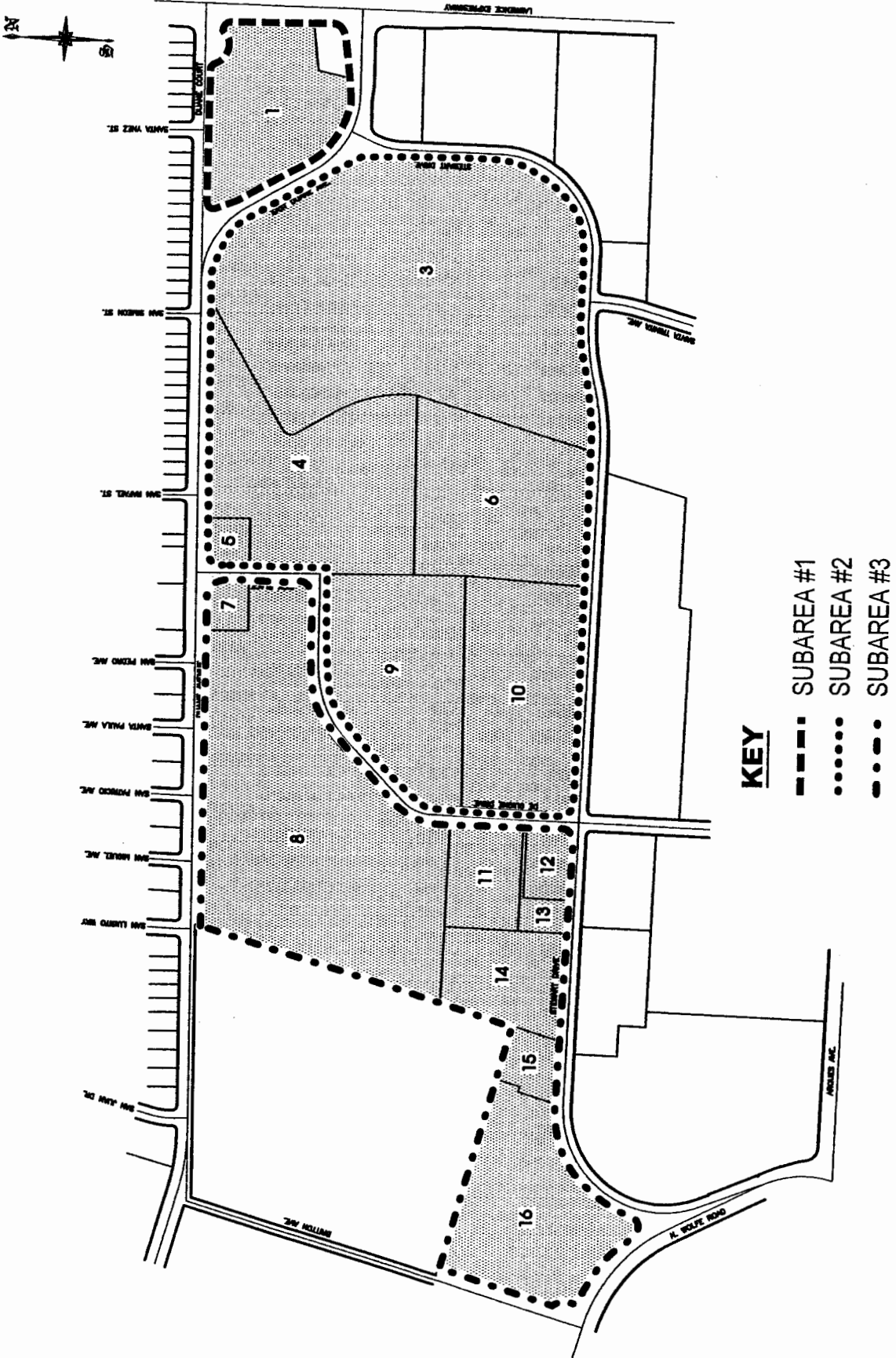
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FIGURE X

PROSPECTIVE EAST SUNNYVALE ITR STUDY AREA



Sunnyvale ITR Site Tree Census						
Location		size class				Comments
ID	Species	small (4-11)	medium (12-23)	large (24<)	Total	
3	Coast redwood	44	96	6	146	Good form and health; crowns were raised to 12'; one tree turning yellow.
3	Evergreen ash	53	205	56	314	Multi-stemmed at 5'-8'; good health; some with poor attachments.
3	Red gum	0	4	3	7	Generally poor health; branches dying back; poor color.
3	Bradford pear	135	0	0	135	Crowns were thinned; generally good health.
3	Italian stone pine	0	6	3	9	Crowns were raised and thinned; multi-stemmed at 5'.
3	Evergreen pear	7	1	0	8	Good form and health; multi-stemmed at 7'; umbrella-shaped crown.
3	Black locust	2	0	0	2	Fair condition; multi-stemmed at 6'.
3	Flowering plum	6	0	0	6	Headed at 15'; multi-stemmed at 6'.
3	Crab apple	1	0	0	1	Headed at 12'.
3	Flowering cherry	16	0	0	16	Multi-stemmed at 5'.
3	Red maple	3	0	0	3	Good form and health.
3	Monterey pine	4	7	0	11	Sparse foliage; pitch moth.
5	Strawberry tree	3	5	0	8	Multi-stemmed at base; good health.
5	Italian buckthorn	2	0	0	2	Multi-stemmed at base; good health.
5	Holly oak	0	1	0	1	Multi-stemmed at base; good health.
6	Bradford pear	19	0	0	19	Multi-stemmed at 6'; crowns were thinned.
6	Flowering cherry	17	0	0	17	Multi-stemmed at 5'.
6	Photinia	6	0	0	6	Multi-stemmed at 5'; poor color foliage.
6	Flowering plum	4	0	0	4	Multi-stemmed at 4'; good health.
6	London plane	81	1	0	82	Good form and health.
6	Grecian laurel	6	0	0	6	Round, dense crown.
6	Coast redwood	19	2	2	23	Good form and health.
6	Brisbane box	13	0	0	13	Good form and health; multi-stemmed at 6'; 1 in poor health.
6	Strawberry tree	12	0	0	12	Good form and health (6'-8' in height)
6	Fern pine	1	0	0	1	Narrow crown.
6	Brazilian pepper	11	0	0	11	Multi-stemmed at base.
6	Japanese maple	5	0	0	5	Good health; multi-stemmed at base.

Sunnyvale ITR Site Tree Census						
Location		size class				Comments
ID	Species	small (4-11)	medium (12-23)	large (24<)	Total	
3	Coast redwood	44	96	6	146	Good form and health; crowns were raised to 12'; one tree turning yellow.
7	Holly oak	1	0	1	2	Street trees; small one in poor health.
7	European birch	5	1	0	6	Fair health; aphid infested.
7	Glossy privet	1	3	0	4	Street trees; fair health.
7	Tulip tree	4	3	1	8	Topped to clear utility lines.
8	Italian stone pine	0	0	1	1	Good form and health.
8	Coast live oak	6	0	0	6	Poor health; poor color.
8	Flowering plum	4	0	0	4	Multi-stemmed at 7'; good health.
8	Japanese maple	3	0	0	3	Multi-stemmed at base; health variable.
8	Crepe myrtle	7	3	0	10	Multi-stemmed at 7'; good health.
8	Glossy privet	0	9	2	11	Multi-stemmed; health fair.
8	Tulip tree	19	4	0	23	Several topped, the others in good condition.
8	Canary Island pine	15	56	4	75	Good form and health.
8	Brisbane box	15	0	0	15	Good form and health.
8	Chinese elm	9	14	0	23	Multi-stemmed at 8'; spreading form; good health.
8	Southern magnolia	8	4	0	12	Good form; poor color.
8	Silk tree	11	5	0	16	Good form and health.
8	Cork oak	1	0	0	1	Good form and health.
8	Sweetgum	33	0	0	33	Multi-stemmed at 12'; good health.
8	Holly oak	13	15	4	32	Multi-stemmed at 12'; good health.
8	Mexican fan palm	0	0	1	1	10' of clear trunk.
8	Nichol's willow leaf peppermint	7	0	0	7	Extremely poor health.
8	Kentucky coffee tree	0	8	0	8	Multi-stemmed at 8'-12'; spreading form; good health.
8	Bradford pear	13	6	0	19	Low, round crown; multiple trunks.
8	Deodar cedar	0	1	0	1	Good form and health.
8	Evergreen pear	7	0	0	7	Good form and health.
8	Monterey pine	2	7	2	11	Fair to poor health.
8	European olive	12	0	0	12	Sheared in "poodle" style.
9	Bradford pear	90	8	0	98	Multi-stemmed at 7'; variable health.
9	Chinese pistache	13	5	0	18	Multi-stemmed at 8'; variable health.

Sunnyvale ITR Site Tree Census						
Location		size class				Comments
ID	Species	small (4-11)	medium (12-23)	large (24<)	Total	
3	Coast redwood	44	96	6	146	Good form and health; crowns were raised to 12'; one tree turning yellow.
9	Aleppo pine	0	39	0	39	Multi-stemmed at 6'; fair health; pitch moth.
9	Coast redwood	6	43	0	49	Good form and health.
9	Southern magnolia	3	1	0	4	Good form; poor color.
9	Blackwood acacia	13	5	0	18	Poor health.
9	Raywood ash	20	0	0	20	Multi-stemmed at 7'; good health.
9	Crepe myrtle	29	59	0	88	Multi-stemmed at base.
9	Deodar cedar	0	0	1	1	Good form and health.
9	Southern live oak	14	4	0	18	Multi-stemmed at 6'; good health.
9	Red oak	4	0	0	4	Excellent form and health; single trunk.
9	European olive	0	1	4	5	Multi-stemmed at base.
9	European birch	26	0	0	26	Upright form; some multi-stemmed.
9	Fern pine	1	0	0	1	Poor structure.
9	Coast live oak	1	0	0	1	Poor color (yellow).
9	Red bud	2	0	0	2	Multi-stemmed at base; good health.
10	London plane	19	0	2	21	Multi-stemmed at 12'; good health.
10	Southern magnolia	11	0	0	11	Good form; poor color.
10	Raywood ash	11	0	0	11	Crowns lean away from building.
10	European birch	30	0	0	30	Multi-stemmed at 5'.
10	Brazilian pepper	5	4	0	9	Multi-stemmed at base; low crown.
10	Ginkgo	2	0	0	2	Good form and health.
10	Flowering plum	15	0	0	15	Multi-stemmed at 6'; good form and health.
10	Coast redwood	43	0	1	44	Generally good health; the large on in poor health.
10	Strawberry tree	2	0	0	2	Good form and health.
10	Holly oak	9	0	0	9	Variable health; small, dense crowns.
10	Deodar cedar	3	3	0	6	Good form and health; one has light colored foliage.
10	Chinese pistache	41	0	0	41	Multi-stemmed at 6'.
10	Brisbane box	38	0	0	38	Poor color foliage.
10	Red bud	21	0	0	21	Good form and health.
10	Fern pine	7	0	0	7	Narrow crowns; some with poor structure.
11	Silver dollar gum	1	2	2	5	Multiple trunks; fair health.
11	Canary Island pine	0	11	0	11	Good form and health (1 dying).

Sunnyvale ITR Site Tree Census						
Location		size class				Comments
ID	Species	small (4-11)	medium (12-23)	large (24<)	Total	
3	Coast redwood	44	96	6	146	Good form and health; crowns were raised to 12'; one tree turning yellow.
11	Carob	0	7	0	7	Multi-stemmed at 8'; good health; leaning trunks.
11	Black locust	10	0	0	10	Multi-stemmed at 8'; round crown.
11	Coast redwood	3	6	0	9	Variable health-good to poor.
11	London plane	4	0	0	4	Good health; leaning trunks.
11	Mexican fan palm	0	1	0	1	6' of clear trunk.
11	Japanese black pine	1	0	0	1	Poor form; good health.
11	Flowering cherry	1	0	0	1	Fair condition; poor structure.
11	Holly oak	0	4	0	4	Multi-stemmed at 8'; good health.
11	Flowering plum	3	0	0	3	Multi-stemmed at 3'; good health.
12	Hollywood juniper	1	2	0	3	Good form and health; multi-stemmed at base.
12	Holly oak	0	2	0	2	Multi-stemmed at 12'; good health.
12	European birch	8	1	0	9	Multi-stemmed at base.
12	Mexican fan palm	0	3	2	5	5'-18' of clear trunk.
13	Coast redwood	2	0	0	2	Good color and form.
13	Evergreen pear	2	0	0	2	Multi-stemmed at 6'; poor color.
13	Sweetgum	2	0	0	2	Multi-stemmed at 4'; poor color.
13	Silver dollar gum	0	0	3	3	Two in good health; one with poor color.
14	Chinese hackberry	4	0	0	4	Multi-stemmed at 8'.
14	Holly oak	4	2	0	6	Poor health; aphid infested.
14	Coast live oak	12	4	0	16	Poor health; poor color.
14	Chinese elm	0	11	0	11	Multi-stemmed at 6'; fair health.
15	Australian willow	0	3	0	3	Multi-stemmed; good health.
15	Red gum	1	2	1	4	Poor color; previously topped.
15	London plane	1	0	0	1	Multi-stemmed at 5'; good health.
15	Flowering gum	0	1	0	1	Poor color and health.
15	Bradford pear	1	0	0	1	Good form and health.
16	Colorado green spruce	11	0	0	11	Good form and health.
16	London plane	90	0	0	90	Multi-stemmed at 7'; good health.
16	White alder	3	0	0	3	Good form and health.
16	Coast redwood	4	19	1	24	Good form and health.
16	Glossy privet	6	1	0	7	Multi-stemmed at base; overgrown hedge.

Sunnyvale ITR Site Tree Census						
Location		size class				Comments
ID	Species	small (4-11)	medium (12-23)	large (24<)	Total	
3	Coast redwood	44	96	6	146	Good form and health; crowns were raised to 12'; one tree turning yellow.
16	Canary Island pine	4	3	0	7	Good form but poor color.
16	English walnut	1	0	0	1	Pruned to clear substation.
16	Red ironbark	0	4	1	5	Multiple trunks; poor color foliage.
16	Australian willow	1	2	0	3	Multi-stemmed at 3'; good health.
16	Hollywood juniper	1	0	0	1	One-half of crown was removed.
16	Southern magnolia	1	0	0	1	Multi-stemmed at 6'; good color.
16	Sweetgum	5	0	0	5	Leaning trunks; central leader removed.
16	European birch	4	0	0	4	Single trunk.
16	Crepe myrtle	4	0	0	4	Good form and health.
16	Evergreen pear	4	0	0	4	Good form and health.

TREE SURVEY

Duane Avenue property
Sunnyvale CA

PREPARED FOR:

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May 2006

Tree Survey
Duane Avenue property
Sunnyvale CA

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Introduction and Overview

The Riding Group is planning to redevelop a section of a large property in Sunnyvale CA. David J. Powers is providing planning guidance to the City of Sunnyvale for the entire property. Current site use of Riding's Duane Avenue consists of turf and associated landscape plantings. HortScience, Inc. was asked to prepare a **Tree Survey** for the site for review by the City of Sunnyvale.

This report provides the following information:

1. A survey of trees within the proposed project area.
2. An assessment of the suitability for preservation of each tree.
3. Guidelines for tree preservation during the design, construction and maintenance phases of development.

Survey Methods

Trees were surveyed in January 2006. The survey included trees greater than 4" in diameter located within and adjacent to the proposed project area. The survey procedure consisted of the following steps:

1. Identifying the tree as to species.
2. Tagging each tree with an identifying number and recording its location on a map. Several trees on the property to the north were included in the assessment but were not tagged.
3. Measuring the trunk diameter at a point 48" above grade.
4. Evaluating the health and structural condition using a scale of 1 – 5 where 1 = poor and 5 = excellent condition.
5. Rating the suitability for preservation as "good", "fair" or "poor". Suitability for preservation considers the health, age and structural condition of the tree, and its potential to remain an asset to the site for years to come.

Description of Trees

One hundred twenty-six (126) trees were evaluated (Table 1), representing 9 species. Descriptions of individual trees are found in the **Tree Survey** and locations are plotted on the **Tree Survey Map** (see Attachments).

Table 1. Tree condition ratings & frequency of occurrence. Duane Ave. Sunnyvale

Common Name	Scientific Name	Condition				No. of Trees
		Poor	Fair	Good	Excell.	
Evergreen ash	<i>Fraxinus uhdei</i>	–	8	62	6	76
Australian willow	<i>Geijera parviflora</i>	3	1	–	–	4
Japanese privet	<i>Ligustrum japonicum</i>	2	3	–	–	5
Olive	<i>Olea europaea</i>	–	–	1	–	1
Monterey pine	<i>Pinus radiata</i>	–	–	1	–	1
Holly oak	<i>Quercus ilex</i>	1	2	3	–	6
Southern live oak	<i>Quercus virginiana</i>	–	1	–	–	1
African sumac	<i>Rhus lancea</i>	–	1	1	–	2
Coast redwood	<i>Sequoia sempervirens</i>	–	1	2	27	30
Total		6	17	70	33	126

All of the trees were planted as part of landscape development for the current site. Trees were not evenly distributed across the site but were concentrated on the periphery. None of the surveyed trees was indigenous to the site.

Two species dominated the surveyed trees: evergreen ash (76 trees, 60% of the total) and coast redwood (30 trees, 24%). No other species was represented by more than 6 trees.



Evergreen ashes were located in two areas: as a double row along the Duane Avenue frontage (photo 1) and as street trees adjacent to a service road and parking area. Trees were mature in development with trunk diameters from 16" to 40". All of the ash trees met the City of Sunnyvale's criteria for Protected status. Overall condition of ash trees was good; none were in poor condition. The form was typical of the species: a vase-shaped crown formed by several scaffold limbs that arose at one point on the trunk and extensive surface roots. A number of ashes had long lateral branches. Several had a history of branch failure.

Photo 1. Double row of evergreen ash along Duane Ave.



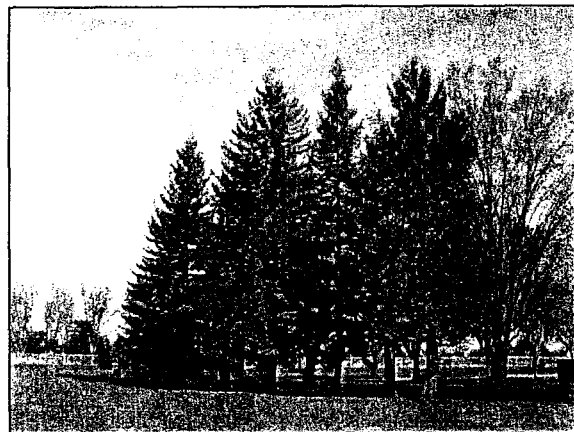
Photo 2. Single row of ash along interior street.



Photo 3. Many ash had large surface roots.

Coast redwoods were a mix of semi-mature and mature in development; all but one were greater than 12" in diameter. Most redwoods were in excellent condition with well-developed crowns (photo 4).

Photo 4. Grove of coast redwoods.



Among the remaining trees were six holly oaks. Installed as street trees along de Guigne Drive, these oaks were mature in development and variable in condition. Several Australian willows and Japanese privets were planted as street trees along Duane Avenue. These were mature in development but poor and fair in condition.

Suitability for Preservation

Before evaluating the impacts that will occur during development, it is important to consider the quality of the tree resource itself, and the potential for individual trees to function well over an extended length of time. Trees that are preserved on development sites must be carefully selected to make sure that they may survive development impacts, adapt to a new environment and perform well in the landscape.

Our goal is to identify trees that have the potential for long-term health, structural stability and longevity. For trees growing in open fields, away from areas where people and property are present, structural defects and/or poor health presents a low risk of damage or injury if they fail. However, we must be concerned about safety in use areas. Therefore, where development encroaches into existing plantings, we must consider their structural stability as well as their potential to grow and thrive in a new environment. Where development will not occur, the normal life cycles of decline, structural failure and death should be allowed to continue.

Evaluation of suitability for preservation considers several factors:

- ✓ **Tree health**
Healthy, vigorous trees are better able to tolerate impacts such as root injury, demolition of existing structures, changes in soil grade and moisture, and soil compaction than are non-vigorous trees.
- ✓ **Structural integrity**
Trees with significant amounts of wood decay and other structural defects that cannot be corrected are likely to fail. Such trees should not be preserved in areas where damage to people or property is likely.
- ✓ **Species response**
There is a wide variation in the response of individual species to construction impacts and changes in the environment. In our experience, for example, Monterey pines are sensitive to construction impacts, while coast redwoods are tolerant of site disturbance.
- ✓ **Tree age and longevity**
Old trees, while having significant emotional and aesthetic appeal, have limited physiological capacity to adjust to an altered environment. Young trees are better able to generate new tissue and respond to change. Most trees on the site were mature in development.
- ✓ **Species invasiveness**
Species which spread across a site and displace desired vegetation are not always appropriate for retention. This is particularly true when indigenous species are displaced. Japanese privet can be a weed, as birds distribute the seed. In contrast, coast redwood rarely reproduces in landscape settings.

Each tree was rated for suitability for preservation based upon its age, health, structural condition and ability to safely coexist within a development environment (Table 2).

Table 2. Tree suitability for preservation. Duane Avenue. Sunnyvale CA.

Good	Trees with good health and structural stability that have the potential for longevity at the site. Thirty-four (34) trees were rated as having good suitability including 28 coast redwoods and 6 evergreen ash.
Moderate	Trees in fair health and/or possessing structural defects that may be abated with treatment. Trees in this category require more intense management and monitoring, and may have shorter life-spans than those in the "good" category. Seventy-two (72) trees were rated as having moderate suitability for preservation including 62 evergreen ash, 1 coast redwood and 3 holly oaks.
Poor	Trees in poor health or possessing significant defects in structure that cannot be abated with treatment. These trees can be expected to decline regardless of management. The species or individual tree may possess either characteristics that are undesirable in landscape settings or be unsuited for use areas. Twenty (20) trees were rated as having poor suitability for preservation including 8 evergreen ash and 1 coast redwood.

We consider trees with good suitability for preservation to be the best candidates for preservation. We do not recommend retention of trees with low suitability for preservation in areas where people or property will be present. Retention of trees with moderate suitability for preservation depends upon the intensity of proposed site changes.

Tree appraisals

The City of Sunnyvale's tree ordinance requires that trees on development sites be appraised. The trees were appraised using the trunk formula method found in the Guide for Plant Appraisal, 9th edition (Champaign IL:2000, International Society of Arboriculture). A regional companion publication, Species Classification and Group Assignment (2004, Western Chapter-International Society of Arboriculture), was also used. The value of landscape trees and plants is based upon four factors: size, species, condition, and location. Size is measured as trunk diameter, at 54" above grade. The species factor considers the adaptability and appropriateness of the plant in the region. Condition reflects the health and structural integrity of the individual tree. The location factor considers the site, placement, and contribution of the tree in the surrounding landscape.

Applying the above-described method to the 126 trees surveyed on the site yielded an aggregate total value of \$499,100. Values for individual trees are shown in the **Tree Survey**.

Tree Preservation Guidelines

The following recommendations will help evaluate impacts to trees from development as well as maintain and improve their health and vitality through the clearing, grading and construction phases. The key elements a tree preservation plan for this site would include:

- Retaining trees in groups such as the evergreen ash plantings along Duane Avenue and near the AMD parking lot, as well as the groups of coast redwoods in the turf area.
- Limiting damage to surface roots of evergreen ash by holding excavation 10' from the tree trunks.
- Providing supplemental irrigation during the demolition and construction phases.

Design recommendations

1. Identify a **TREE PROTECTION ZONE** in which no construction, grading and underground services including utilities, sub-drains, water or sewer will be located. For design purposes, the **TREE PROTECTION ZONE** should be either the dripline or edge of existing pavement, whichever is larger.
2. Include **Tree Preservation Notes**, prepared by the Consulting Arborist, should be included on all plans.
3. Verify that any herbicides placed under paving materials are safe for use around trees and labeled for that use.
4. Design irrigation systems so that no trenching will occur not within the **TREE PROTECTION ZONE**.
5. If expansive soils are present on the site, design foundations, footings and pavement to withstand differential displacement.

Pre-construction treatments and recommendations

1. Have the construction superintendent meet with the Consulting Arborist before beginning work to discuss work procedures and tree protection.
2. Fence all trees to be retained to completely enclose the **TREE PROTECTION ZONE** prior to demolition, grubbing or grading. Fences shall be 6 ft. chain link or equivalent as approved by consulting arborist. Fences are to remain until all grading and construction is completed.
3. Prune evergreen ash trees to be preserved to clean the crown, reduce the length of long lateral branches and to provide clearance. All pruning shall be completed by a Certified Arborist or Tree Worker and adhere to the *Tree Pruning Guidelines* of the International Society of Arboriculture. Brush shall be chipped and spread beneath the trees within the **TREE PROTECTION ZONE**.

Recommendations for tree protection during construction

1. Prohibit grading, construction, demolition or other work within the **TREE PROTECTION ZONE**. Any modifications must be approved and monitored by the Consulting Arborist.
2. Ensure that any root pruning required for construction purposes shall receive the prior approval of, and be supervised by, the Consulting Arborist.
3. Supplement natural rainfall with irrigation, at a rate determined by the Consulting Arborist.

4. Evaluate any injury to trees that should occur during construction. Notify the Consulting Arborist so that appropriate treatments can be applied.
5. Prohibit the dumping and/or storage of excess soil, chemicals, debris, equipment or other materials within the **TREE PROTECTION ZONE**.
6. Require that any tree pruning needed for clearance during construction must be performed by a Certified Arborist and not by construction personnel.

Summary

One hundred twenty-six (126) trees were evaluated. All were planted exotics; none were indigenous to the site. Evergreen ash (76) and coast redwood (30) dominate the surveyed trees. Trees of these two species were in good to excellent condition and provide the best opportunities for preservation. Total of appraised values for all the trees was \$499,100. Decisions regarding preservation or removal of individual trees will be considered as site plans are finalized.

HortScience, Inc.

James R. Clark, Ph.D.
Certified Arborist WE-0846
Registered Consulting Arborist #357

Duane Avenue (Riding Group Project)
Sunnyvale CA
January 2006

TREE No.	SPECIES	TRUNK DIAMETER (in.)	PROTECTED TREE?	CONDITION 1=poor 5=excellent	APPRAISED VALUE US \$	SUITABILITY for PRESERVATION	COMMENTS
201	Monterey pine	19	Yes	4	\$1,200	Moderate	Offsite; good crown; extensive pitch flow along trunk.
202	Coast redwood	26	Yes	5	\$8,700	Good	Good form & structure.
203	Coast redwood	25	Yes	5	\$8,050	Good	Good form & structure.
204	Coast redwood	22	Yes	5	\$6,250	Good	Good form & structure.
205	Coast redwood	26	Yes	5	\$8,700	Good	Good form & structure.
206	Coast redwood	20	Yes	5	\$5,200	Good	Good form & structure.
207	Coast redwood	19	Yes	5	\$4,700	Good	Good form & structure.
208	Coast redwood	27	Yes	5	\$9,400	Good	Good form & structure; surface roots.
209	Coast redwood	20	Yes	5	\$5,200	Good	Good form & structure.
210	Coast redwood	19	Yes	5	\$4,700	Good	Good form & structure; interior.
211	Coast redwood	14	Yes	3	\$1,450	Poor	Codominant trunks @ 15'; thin canopy.
212	Coast redwood	19	Yes	5	\$4,700	Good	Good form & structure.
213	Coast redwood	20	Yes	5	\$5,200	Good	Good form & structure.
214	Coast redwood	19	Yes	5	\$4,700	Good	Good form & structure.
215	Coast redwood	18	Yes	4	\$3,300	Good	Good form & structure; interior.
216	Coast redwood	19	Yes	5	\$4,700	Good	Good form & structure; interior.
217	Coast redwood	24	Yes	5	\$7,450	Good	Good form & structure.
218	Coast redwood	20	Yes	5	\$5,200	Good	Good form & structure; interior.
219	Coast redwood	22	Yes	5	\$6,250	Good	Good form & structure.
220	Coast redwood	21	Yes	5	\$5,700	Good	Good form & structure.
221	Coast redwood	23	Yes	5	\$6,850	Good	Good form & structure.
222	Coast redwood	23	Yes	5	\$6,850	Good	Good form & structure.
223	Evergreen ash	22	Yes	4	\$2,700	Moderate	Vase-shaped crown; surface roots.

Duane Avenue (Riding Group Project)
Sunnyvale CA
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TREE No.	SPECIES	TRUNK DIAMETER (in.)	PROTECTED TREE?	CONDITION 1=poor 5=excellent	APPRAISED VALUE US \$	SUITABILITY for PRESERVATION	COMMENTS
224	Evergreen ash	26	Yes	4	\$3,750	Moderate	Vase-shaped crown; surface roots; codominant trunks @ 8'; good attachment.
225	Evergreen ash	32	Yes	4	\$5,550	Moderate	Vase-shaped crown; surface roots; multiple attachments @ 12'.
226	Evergreen ash	17	Yes	4	\$1,650	Moderate	Vase-shaped crown; surface roots; codominant trunks @ 8'; poor attachment.
227	Evergreen ash	20	Yes	4	\$2,250	Moderate	Vase-shaped crown; surface roots.
228	Evergreen ash	19	Yes	4	\$2,050	Moderate	Vase-shaped crown; surface roots; codominant trunks @ 6'.
229	Evergreen ash	31	Yes	4	\$5,200	Moderate	Vase-shaped crown; surface roots; multiple attachments @ 6' with included bark; cable.
230	Evergreen ash	19	Yes	4	\$2,050	Moderate	Vase-shaped crown; surface roots; multiple attachments @ 7'.
231	Evergreen ash	24	Yes	5	\$4,150	Good	Vase-shaped crown; surface roots.
232	Evergreen ash	25	Yes	4	\$3,500	Moderate	Vase-shaped crown; surface roots; codominant trunks @ 8' & 9'.
233	Evergreen ash	18	Yes	5	\$2,350	Good	Vase-shaped crown; surface roots.
234	Evergreen ash	28	Yes	4	\$4,350	Moderate	Vase-shaped crown; surface roots; multiple attachments @ 6'.
235	Evergreen ash	20	Yes	5	\$2,900	Good	Vase-shaped crown; surface roots.
236	Coast redwood	24	Yes	5	\$7,450	Good	Good form & structure; corrected lean to S.
237	Coast redwood	16	Yes	4	\$2,600	Moderate	Good form & structure; thin & yellow.
238	Coast redwood	20	Yes	5	\$5,200	Good	Good form & structure; corrected lean to S.
239	Coast redwood	30	Yes	5	\$11,500	Good	Good form & structure.
240	Coast redwood	16	Yes	5	\$3,350	Good	Good form & structure.

Duane Avenue (Riding Group Project)
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TREE No.	SPECIES	TRUNK DIAMETER (in.)	PROTECTED TREE?	CONDITION 1=poor 5=excellent	APPRAISED VALUE US \$	SUITABILITY for PRESERVATION	COMMENTS
241	Coast redwood	7	No	5	\$750	Good	Good form & structure; bowed S.
242	Coast redwood	16	Yes	5	\$3,350	Good	Good form & structure.
243	Coast redwood	21	Yes	5	\$5,700	Good	Good form & structure.
244	Coast redwood	35	Yes	5	\$15,150	Good	Good form & structure; corrected lean to S.
245	Evergreen ash	28	Yes	4	\$4,350	Moderate	Vase-shaped crown; surface roots; multiple attachments @ 10' with included bark; cable.
246	Evergreen ash	27	Yes	4	\$4,050	Moderate	Vase-shaped crown; surface roots; codominant trunks @ 5' & 6'; heavy lateral limb over road.
247	Evergreen ash	27	Yes	4	\$4,050	Moderate	Vase-shaped crown; surface roots; multiple attachments @ 8'; upright but poor attachments.
248	Evergreen ash	32	Yes	5	\$7,150	Good	Vase-shaped crown; surface roots; multiple attachments @ 12'.
249	Evergreen ash	31	Yes	5	\$6,700	Good	Vase-shaped crown; surface roots; codominant trunks @ 7'; heavy lateral limb over road.
250	Evergreen ash	25	Yes	3	\$2,500	Poor	Codominant trunks @ 5'; scaffold failure; leans SW.
251	Evergreen ash	25	Yes	4	\$3,500	Moderate	Vase-shaped crown; surface roots.
252	Evergreen ash	23	Yes	4	\$2,950	Moderate	Vase-shaped crown; surface roots; multiple attachments @ 7' with included bark; heavy lateral limb over road.
253	Evergreen ash	35	Yes	4	\$6,550	Moderate	Vase-shaped crown; surface roots; multiple attachments @ 6'.
254	Evergreen ash	27	Yes	4	\$4,050	Moderate	Vase-shaped crown; surface roots; multiple attachments @ 12'.

Duane Avenue (Riding Group Project)
Sunnyvale CA
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TREE No.	SPECIES	TRUNK DIAMETER (in.)	PROTECTED TREE?	CONDITION 1=poor 5=excellent	APPRAISED VALUE US \$	SUITABILITY for PRESERVATION	COMMENTS
255	Evergreen ash	26	Yes	4	\$3,750	Moderate	Vase-shaped crown; surface roots; codominant trunks @ 6' with included bark.
256	Evergreen ash	31	Yes	5	\$6,700	Good	Vase-shaped crown; surface roots.
257	Evergreen ash	20	Yes	4	\$2,250	Moderate	Vase-shaped crown; surface roots.
258	Evergreen ash	26	Yes	3	\$2,700	Poor	Vase-shaped crown; surface roots; several scaffolds stubbed off; at least 3 branch failures.
259	Evergreen ash	32	Yes	3	\$3,950	Poor	Vase-shaped crown; surface roots; multiple attachments @ 5'; several branch failures.
260	Evergreen ash	29	Yes	3	\$3,350	Poor	Vase-shaped crown; surface roots; multiple attachments @ 4' with included bark extending to base on SW, SE & N.
261	Evergreen ash	16	Yes	4	\$1,450	Moderate	Vase-shaped crown; surface roots.
262	Evergreen ash	19	Yes	4	\$2,050	Moderate	Vase-shaped crown; surface roots.
263	Evergreen ash	20	Yes	4	\$2,250	Moderate	Vase-shaped crown; surface roots; codominant trunks @ 8' & 10'; one-sided to S.
264	Evergreen ash	24	Yes	4	\$3,200	Moderate	Vase-shaped crown; surface roots.
265	Evergreen ash	24	Yes	3	\$2,300	Poor	Vase-shaped crown; surface roots; codominant trunks @ 6'; scaffold branch failure.
266	Evergreen ash	22	Yes	4	\$2,700	Moderate	Vase-shaped crown; surface roots.
267	Evergreen ash	20	Yes	4	\$2,250	Moderate	Vase-shaped crown; surface roots; multiple attachments @ 5'.
268	Evergreen ash	40	Yes	4	\$8,100	Moderate	Vase-shaped crown; surface roots; multiple attachments @ 5'.

Duane Avenue (Riding Group Project)
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TREE No.	SPECIES	TRUNK DIAMETER (in.)	PROTECTED TREE?	CONDITION 1=poor 5=excellent	APPRAISED VALUE US \$	SUITABILITY for PRESERVATION	COMMENTS
269	Evergreen ash	30	Yes	4	\$5,000	Moderate	Vase-shaped crown; girdling root; multiple attachments @ 6' with poor attachment.
270	Evergreen ash	26	Yes	4	\$3,750	Moderate	Vase-shaped crown; surface roots; codominant trunks @ 6' & 10' with included bark; branch failure.
271	Evergreen ash	24	Yes	4	\$3,200	Moderate	Vase-shaped crown; surface roots.
272	Evergreen ash	28	Yes	4	\$4,350	Moderate	Vase-shaped crown; surface roots; codominant trunks @ 12'; multiple attachments @ 16' on both stems.
273	Evergreen ash	20	Yes	3	\$1,600	Poor	Vase-shaped crown; surface roots; numerous branch failures.
274	Evergreen ash	33	Yes	4	\$6,050	Moderate	Vase-shaped crown; surface roots; codominant trunks @ 15'; heavy lateral limb over sidewalk.
275	Evergreen ash	29	Yes	4	\$4,650	Moderate	Vase-shaped crown; surface roots; codominant trunks @ 6' & 7'.
276	Evergreen ash	27	Yes	3	\$2,900	Poor	Poor form & structure; heavy lateral limb over sidewalk; all codominant trunks have poor attachments
277	Evergreen ash	19	Yes	4	\$2,100	Moderate	Vase-shaped crown; surface roots.
278	Evergreen ash	30	Yes	4	\$5,000	Moderate	Vase-shaped crown; surface roots; multiple attachments @ 12'; heavy lateral limb developing on N.
279	Evergreen ash	24	Yes	4	\$3,200	Moderate	Narrow vase-shaped crown; surface roots; ext. epicormic shoots throughout crown.
280	Evergreen ash	24	Yes	4	\$3,200	Moderate	Vase-shaped crown; surface roots.

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TREE No.	SPECIES	TRUNK DIAMETER (in.)	PROTECTED TREE?	CONDITION 1=poor 5=excellent	APPRAISED VALUE US \$	SUITABILITY for PRESERVATION	COMMENTS
281	Evergreen ash	36	Yes	4	\$6,850	Moderate	Vase-shaped crown; surface roots; multiple attachments @ 10'; cable.
282	Evergreen ash	22	Yes	4	\$2,700	Moderate	Vase-shaped crown; surface roots.
283	Evergreen ash	32	Yes	4	\$5,550	Moderate	Vase-shaped crown; surface roots; multiple attachments @ 10'.
284	Evergreen ash	28	Yes	4	\$4,350	Moderate	Vase-shaped crown; surface roots; multiple attachments @ 18'; heavy lateral limb on S.
285	Evergreen ash	25	Yes	3	\$2,500	Poor	Poor form & structure; codominant trunks @ 12' with poor attachment.
286	Evergreen ash	28	Yes	4	\$4,350	Moderate	Vase-shaped crown; surface roots; multiple attachments @ 10'.
287	Evergreen ash	21	Yes	4	\$2,450	Moderate	Vase-shaped crown; surface roots; 1 girdling; multiple attachments @ 10'.
288	Evergreen ash	24	Yes	4	\$3,200	Moderate	Surface roots; multiple attachments @ 15'; narrow & upright.
289	Evergreen ash	31	Yes	4	\$5,200	Moderate	Vase-shaped crown; surface roots; multiple attachments @ 8'.
290	Evergreen ash	21	Yes	4	\$2,450	Moderate	Vase-shaped crown; surface roots.
291	Evergreen ash	24	Yes	4	\$3,200	Moderate	Vase-shaped crown; surface roots; sinuous trunk; heavy lateral limb to S.
292	Evergreen ash	18	Yes	4	\$1,850	Moderate	Vase-shaped crown; surface roots; multiple attachments @ 10'.
293	Evergreen ash	25	Yes	4	\$3,500	Moderate	Vase-shaped crown; surface roots; heavy lateral limb to S.
294	Evergreen ash	28	Yes	4	\$4,350	Moderate	Vase-shaped crown; surface roots.

Duane Avenue (Riding Group Project)
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TREE No.	SPECIES	TRUNK DIAMETER (in.)	PROTECTED TREE?	CONDITION 1=poor 5=excellent	APPRAISED VALUE US \$	SUITABILITY for PRESERVATION	COMMENTS
295	Evergreen ash	16	Yes	4	\$1,450	Moderate	Vase-shaped crown; surface roots; one-sided to S.
296	Evergreen ash	29	Yes	4	\$4,650	Moderate	Vase-shaped crown; surface roots; multiple attachments @ 15'; upright; cable.
297	Evergreen ash	31	Yes	4	\$5,200	Moderate	Vase-shaped crown; surface roots; multiple attachments @ 15'.
298	Evergreen ash	19	Yes	4	\$2,050	Moderate	Bowed S.; surface roots.
299	Evergreen ash	28	Yes	4	\$4,350	Moderate	Vase-shaped crown; surface roots; multiple attachments @ 9'; branch failure.
300	Evergreen ash	35	Yes	4	\$6,550	Moderate	Vase-shaped crown; surface roots; multiple attachments @ 8' with poor attachments.
301	Evergreen ash	27	Yes	4	\$4,050	Moderate	Vase-shaped crown; surface roots; codominant trunks @ 8' with included bark.
302	Evergreen ash	22	Yes	4	\$2,700	Moderate	Vase-shaped crown; surface roots; codominant trunks @ 10' with included bark.
303	Evergreen ash	24	Yes	4	\$3,200	Moderate	Vase-shaped crown; surface roots.
304	Evergreen ash	18	Yes	4	\$1,850	Moderate	Vase-shaped crown; surface roots; low scaffold @ 8' was removed; codominant trunks @ 12'.
305	Evergreen ash	31	Yes	4	\$5,200	Moderate	Vase-shaped crown; surface roots; multiple attachments @ 6'.
306	Evergreen ash	24	Yes	4	\$3,200	Moderate	Vase-shaped crown; surface roots; multiple attachments @ 8'.
307	Evergreen ash	26	Yes	4	\$3,750	Moderate	Vase-shaped crown; surface roots; codominant trunks @ 5'.

Duane Avenue (Riding Group Project)
Sunnyvale CA
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TREE No.	SPECIES	TRUNK DIAMETER (in.)	PROTECTED TREE?	CONDITION 1=poor 5=excellent	APPRAISED VALUE US \$	SUITABILITY for PRESERVATION	COMMENTS
308	Olive	16,14,13,12	Yes	4	\$7,450	Moderate	Multiple attachments @ base; bowed apart; stems shortened; crack @ base of attachment between 13" & 12".
309	Southern live oak	4	No	3	\$300	Moderate	Flat-topped; chlorotic.
310	Holly oak	13	Yes	4	\$2,800	Moderate	Codominant trunks @ 6'; spread apart.
311	Holly oak	11	No	2	\$850	Poor	Poor form & structure; trunk decay.
312	Holly oak	19	Yes	3	\$4,250	Poor	Poor form & structure; trunk wound on S.
313	Holly oak	16	Yes	3	\$3,000	Poor	Extensive decay @ old pruning cut @ 8'; dense crown.
314	Holly oak	13	Yes	4	\$2,800	Moderate	Strong lean S. into project; dense crown.
315	Holly oak	17	Yes	4	\$4,750	Moderate	Dense crown; rounded crown.
316	African sumac	8	No	4	\$450	Moderate	Corrected lean to S.
317	African sumac	12	Yes	3	\$750	Poor	Scaffold branch failure on NW; topped & crown raised to stubs.
318	Japanese privet	12	Yes	2	\$350	Poor	Extensive twig dieback; declining.
319	Japanese privet	15	Yes	3	\$900	Poor	Leans E. trunk wounds.
320	Australian willow	21	Yes	3	\$3,700	Poor	Multiple attachments @ 4' with included bark; scaffold branch failure on N.
321	Japanese privet	18	Yes	3	\$1,300	Moderate	One-sided to N. ; multiple attachments @ 6'.
322	Australian willow	16	Yes	2	\$1,300	Poor	Extensive wounds on N. ; flat-topped & one-sided.
323	Australian willow	16	Yes	2	\$1,300	Poor	Leans N. ; poor form & structure.

Duane Avenue (Riding Group Project)
Sunnyvale CA
January 2006

TREE No.	SPECIES	TRUNK DIAMETER (in.)	PROTECTED TREE?	CONDITION 1=poor 5=excellent	APPRAISED VALUE US \$	SUITABILITY for PRESERVATION	COMMENTS
324	Australian willow	12	Yes	2	\$750	Poor	Trunk wound on N. from base to 10'; poor form & structure.
325	Japanese privet	15	Yes	3	\$900	Moderate	Multiple attachments @ 6'; suppressed by adjacent ash.
326	Japanese privet	17	Yes	2	\$700	Poor	Declining with extensive twig dieback; bleeding from trunk wound on SW.

Tree Survey
Taylor Woodrow Site
Sunnyvale CA



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April 2006

Tree Survey
Taylor Woodrow Site
Sunnyvale CA

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Tree Survey
Tree Survey Map

Introduction and Overview

Taylor Woodrow Homes is planning to build a residential housing project on this site, bounded by Duane Avenue, Duane Court, and Lawrence Expressway in Sunnyvale, California. The site currently used for commercial office space. HortScience, Inc. was asked to prepare a Tree Preservation Report for the site for review by the City of Sunnyvale.

This report provides the following information:

1. A survey of trees growing within and adjacent to the project area.
2. An assessment of the impacts of constructing the proposed project on the trees.
3. Guidelines for tree preservation during the design, construction and maintenance phases of development.

Survey Methods

Trees were surveyed on March 23, 2006. The survey included all trees growing on the site. The survey procedure consisted of the following steps:

1. Identifying the tree as to species;
2. Measuring the trunk diameter at a point 48" above grade;
3. Evaluating the health and structural condition using a scale of 1 – 5:
 - 5 - A healthy, vigorous tree, reasonably free of signs and symptoms of disease, with good structure and form typical of the species.
 - 4 - Tree with slight decline in vigor, small amount of twig dieback, minor structural defects that could be corrected.
 - 3 - Tree with moderate vigor, moderate twig and small branch dieback, thinning of crown, poor leaf color, moderate structural defects that might be mitigated with regular care.
 - 2 - Tree in decline, epicormic growth, extensive dieback of medium to large branches, significant structural defects that cannot be abated.
 - 1 - Tree in severe decline, dieback of scaffold branches and/or trunk; most of foliage from epicormics; extensive structural defects that cannot be abated.
4. Rating the suitability for preservation as "good", "moderate" or "poor". Suitability for preservation considers the health, age and structural condition of the tree, and its potential to remain an asset to the site for years to come.

- Good:** Trees with good health and structural stability that have the potential for longevity at the site.
- Moderate:** Trees with somewhat declining health and/or structural defects than can be abated with treatment. The tree will require more intense management and monitoring, and may have shorter life span than those in 'good' category.
- Poor:** Trees in poor health or with significant structural defects that cannot be mitigated. Tree is expected to continue to decline, regardless of treatment. The species or individual may have characteristics that are undesirable for landscapes, and generally are unsuited for use areas.

Description of Trees

One hundred fourteen (114) trees were evaluated. Descriptions of each tree are found in the **Tree Survey**. Locations are plotted on the **Tree Survey Map**. A summary is provided in Table 1.

There were 14 taxa represented at the site (Table 1). The most frequently occurring species was flowering plum with 16 trees (14% of the population). There were 14 fern pines, and 12 each of crepe myrtle and European birch. For larger growing species, there were 11 sweetgum, nine (9) Monterey pines, and also nine (9) southern magnolias.

Tree condition was generally fair (59%) to good (28%). Twenty-three (23) trees were in poor condition.

Trees in poor condition included fern pines that had been topped and sheared, resulting in trees with poor structure. The Monterey pines were in declining health, being adapted to the cool, moist climate of the coast rather than the warmer inland climate present on this site. Alternatively, all 12 crepe myrtles were in good condition.

The trees were growing in planting beds near the buildings, and in islands in the parking areas.

Tree size ranged from 5" to 32" in diameter; many were in the 12"-15" diameter range.

Table 1: Condition ratings and frequency of occurrence of trees.

Common Name	Scientific Name	Condition Rating			No. of Trees
		Poor (1-2)	Fair (3)	Good (4-5)	
European birch	<i>Betula pendula</i>	3	6	3	12
Lemon bottlebrush	<i>Calistemon citrinus</i>	--	11	--	11
Blue atlas cedar	<i>Cedrus atlantica</i> 'Glauca'	--	1	1	2
Australian willow	<i>Geijera parviflora</i>	2	7	--	9
Crepe myrtle	<i>Lagerstroemia indica</i>	--	--	12	12
Sweetgum	<i>Liquidambar styraciflua</i>	--	6	5	11
Southern magnolia	<i>Magnolia grandiflora</i>	--	6	3	9
Monterey pine	<i>Pinus radiata</i>	8	1	--	9
Fern pine	<i>Podocarpus gracilior</i>	8	4	2	14
Flowering plum	<i>Prunus cerasifera</i>	--	16	--	16
Bradford pear	<i>Pyrus calleryana</i>	2	--	4	6
Coast redwood	<i>Sequoia sempervirens</i>	--	1	2	3
Total		23 20%	59 52%	32 28%	114 100%

None of the trees was native to the area; all were planted exotics.

The City of Sunnyvale defines "Protected Trees" as those with trunk diameters of 12" and greater. Thirty (30) of the surveyed trees meet that criterion. Protected trees are identified on the **Tree Survey**.

Suitability for Preservation

Before evaluating the impacts that will occur during development, it is important to consider the quality of the tree resource itself, and the potential for individual trees to function well over an extended length of time. Trees that are preserved on development sites must be carefully selected to make sure that they may survive development impacts, adapt to a new environment and perform well in the landscape.

Our goal is to identify trees that have the potential for long-term health, structural stability and longevity. For trees growing in open fields, away from areas where people and property are present, structural defects and/or poor health presents a low risk of damage or injury if they fail. However, we must be concerned about safety in use areas. Therefore, where development encroaches into existing plantings, we must consider their structural stability as well as their potential to grow and thrive in a new environment. Where development will not occur, the normal life cycles of decline, structural failure and death should be allowed to continue.

Evaluation of suitability for preservation considers several factors:

- **Tree health**
Healthy, vigorous trees are better able to tolerate impacts such as root injury, demolition of existing structures, changes in soil grade and moisture, and soil compaction than are non-vigorous trees.
- **Structural integrity**
Trees with significant amounts of wood decay and other structural defects that cannot be corrected are likely to fail. Such trees should not be preserved in areas where damage to people or property is likely.
- **Species response**
There is a wide variation in the response of individual species to construction impacts and changes in the environment. In our experience, for example, Monterey pine is sensitive to construction impacts, while coast redwood is tolerant of site disturbance.
- **Tree age and longevity**
Old trees, while having significant emotional and aesthetic appeal, have limited physiological capacity to adjust to an altered environment. Young trees are better able to generate new tissue and respond to change.
- **Invasiveness**
Trees with the potential to invade an established forest, reproduce rapidly, and grow in sub-optimal environments are considered invasive. Species with these qualities may alter the function and aesthetics of the forest. None of the trees present on this site were particularly invasive.

Each tree was rated for suitability for preservation based upon its age, health, structural condition and ability to safely coexist within a development environment (Table 2).

We consider trees with good suitability for preservation to be the best candidates for preservation. We do not recommend retention of trees with low suitability for preservation in areas where people or property will be present. Retention of trees with moderate suitability for preservation depends upon the intensity of proposed site changes.

Table 2: Tree Suitability for Preservation

Good	These are trees with good health and structural stability that have the potential for longevity at the site. Thirty-two (32) trees were rated as having good suitability for preservation. Crepe myrtle was the most commonly occurring species in this category with 12 trees.
Moderate	Trees in this category have fair health and/or structural defects that may be abated with treatment. These trees require more intense management and monitoring, and may have shorter life-spans than those in the "good" category. Fifty-nine (59) trees were rated as having moderate suitability for preservation. These included 16 flowering plums, and 11 lemon bottlebrushes.
Poor	Trees in this category are in poor health or have significant defects in structure that cannot be abated with treatment. These trees can be expected to decline regardless of management. The species or individual tree may possess either characteristics that are undesirable in landscape settings or be unsuited for use areas. Twenty-three (23) trees were rated as having poor suitability for preservation. These included eight (8) Monterey pines and eight (8) fern pines.

Evaluation of Impacts and Recommendations for Preservation

Appropriate tree retention develops a practical match between the location and intensity of construction activities and the quality and health of trees. The ***Tree Survey*** was the reference point for tree condition and quality. Potential impacts from construction were evaluated using the Scheme 4-Conceptual Site Plan prepared by KTGy, Inc, dated January 11, 2006.

Potential impacts from construction were estimated for each tree. The most significant impacts to the trees would occur as a result of the excavation and grading for building pads and parking areas, and trenching for underground utilities.

Based on my evaluation of the Conceptual Site Plan, the proposed development would require the removal of all trees growing in the interior areas of the site. This is due to the intensity of excavation and grading required for building the multi-story residential and townhouse buildings and associated parking features.

The 48 trees growing on the periphery of the site have the potential to be preserved, if the project's design can accommodate them. Of the 48 border trees, 11 are poor in suitability for preservation. The remaining 37 trees are good or moderate in suitability for preservation (Table 3, next page).

Table 3: Trees with potential for preservation, based on location (periphery) and suitability (good or moderate)

Tree No.	Species	Trunk Diameter (inches)
1	Monterey pine	20
2	Coast redwood	18
5	Coast redwood	29
7	Coast redwood	32
9	European birch	7
55	Southern magnolia	23
57	Blue atlas cedar	27
58	Southern magnolia	10
82	Southern magnolia	12,7,7
83	Blue atlas cedar	15
86	European birch	9,9
87	European birch	9,9,7
88	European birch	9,9,8
89	European birch	10,9,9
90	European birch	17,11
92	Australian willow	6,5,4,3,3
93	Australian willow	12,8
94	Australian willow	10
95	Australian willow	6,6,6,5
96	Australian willow	8
97	Australian willow	7
99	Australian willow	6,6,5,5,4,4
100	Southern magnolia	10
101	Lemon bottlebrush	7,5,4
102	Lemon bottlebrush	6,6,4,2
103	Lemon bottlebrush	6,5,5,3
104	Lemon bottlebrush	6,6,5,4,2
105	Lemon bottlebrush	5
106	Lemon bottlebrush	7,6,4,4,3
107	Southern magnolia	10
108	Lemon bottlebrush	6,4,4,3
109	Lemon bottlebrush	8,5,5,5
110	Lemon bottlebrush	8,6,6,5
111	Southern magnolia	14
112	Southern magnolia	5
113	Southern magnolia	11,5
114	Southern magnolia	7

Tree appraisals

The City of Sunnyvale's tree ordinance requires that trees on development sites be appraised. The trees were appraised using the trunk formula method found in the Guide for Plant Appraisal, 9th edition (Champaign IL:2000, International Society of Arboriculture). A regional companion publication, Species Classification and Group Assignment (2004, Western Chapter-International Society of Arboriculture), was also used. The value of landscape trees and plants is based upon four factors: size, species, condition, and location. Size is measured as trunk diameter, at 54" above grade. The species factor considers the adaptability and appropriateness of the plant in the region.

Condition reflects the health and structural integrity of the individual tree. The location factor considers the site, placement, and contribution of the tree in the surrounding landscape.

Applying the above-described method to the 114 trees surveyed on the site yielded an aggregate total value of \$134,400. Values for individual trees are shown in the **Tree Survey**.

Tree Preservation Guidelines

The goal of tree preservation is not merely tree survival during development but maintenance of tree health and beauty for many years. Trees retained on sites that are either subject to extensive injury during construction or are inadequately maintained become a liability rather than an asset. The response of individual trees will depend on the amount of excavation and grading, the care with which demolition is undertaken, and the construction methods. Coordinating any construction activity inside the Tree Protection Zone can minimize these impacts.

The following recommendations will help reduce impacts to trees from development and maintain and improve their health and vitality through the clearing, grading and construction phases.

Design recommendations

1. A **TREE PROTECTION ZONE** shall be established around each tree. For design purposes the TPZ shall be defined at the edge of the dripline. No grading, excavation, construction or storage of materials shall occur within that zone. When trunks are accurately located and development plans refined, the Consulting Arborist will identify specific **TREE PROTECTION ZONES** for each tree.
2. No underground services including utilities, sub-drains, water or sewer shall be placed in the **TREE PROTECTION ZONE**.
3. **Tree Preservation Notes**, prepared by the Consulting Arborist, should be included on all plans.
4. Any herbicides placed under paving materials must be safe for use around trees and labeled for that use.
5. Irrigation systems must be designed so that no trenching will occur not within the **TREE PROTECTION ZONE**.
6. As trees withdraw water from the soil, expansive soils may shrink within the root area. Therefore, foundations, footings and pavements on expansive soils near trees should be designed to withstand differential displacement.

Pre-construction treatments and recommendations

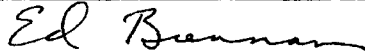
1. The construction superintendent shall meet with the Consulting Arborist before beginning work to discuss work procedures and tree protection.
2. Fence all trees to be retained to completely enclose the **TREE PROTECTION ZONE** prior to demolition, grubbing or grading. Fences shall be 6 ft. chain link or equivalent as approved by consulting arborist. Fences are to remain until all grading and construction is completed.

Recommendations for tree protection during construction

1. No grading, construction, demolition or other work shall occur within the **TREE PROTECTION ZONE**. Any modifications must be approved and monitored by the Consulting Arborist.
2. Any root pruning required for construction purposes shall receive the prior approval of, and be supervised by, the Consulting Arborist.
3. Supplemental irrigation shall be applied as determined by the Consulting Arborist.
4. If injury should occur to any tree during construction, it should be evaluated as soon as possible by the Consulting Arborist so that appropriate treatments can be applied.

5. No excess soil, chemicals, debris, equipment or other materials shall be dumped or stored within the **TREE PROTECTION ZONE**.
6. Any additional tree pruning needed for clearance during construction must be performed by a Certified Arborist and not by construction personnel.

HortScience, Inc.



Ed Brennan
Certified Arborist WE-0105A
Registered Consulting Arborist #373

David Powers and Associates
Duave Avenue Site (Taylor Woodrow Project)
Sunnyvale CA
March 2006

TREE SPECIES No.	TRUNK DIAMETER (inches)	CONDITION 1=POOR 5=EXCELLENT	Protected TREE?	APPRAISED VALUE US\$	SUITABILITY FOR PRESERVATION	COMMENTS
1 Monterey pine	20	3	Yes	\$950	Moderate	Pitch moth, poor color.
2 Coast redwood	18	3	Yes	\$2,350	Moderate	Good form, poor color.
3 Monterey pine	19	2	Yes	\$500	Poor	Pitch moth, broken branch.
4 Monterey pine	23	2	Yes	\$750	Poor	Pitch moth, broken branch.
5 Coast redwood	29	4	Yes	\$8,400	Good	Good form and health.
6 Monterey pine	18	2	Yes	\$450	Poor	Pitch moth, broken branch.
7 Coast redwood	32	4	Yes	\$10,000	Good	Good form and health.
8 Monterey pine	15	2	Yes	\$350	Poor	Pitch moth, broken branch.
9 European birch	7	3	No	\$400	Moderate	Multi-stemmed at 5', sooty mold.
10 Lemon bottlebrush	10,7	3	No	\$1,350	Moderate	Multi-stemmed at base.
11 Lemon bottlebrush	7,3,2	3	No	\$600	Moderate	Multi-stemmed at base.
12 European birch	6	2	No	\$200	Poor	Multi-stemmed at 5', sooty mold.
13 Fern pine	13	4	Yes	\$2,800	Good	Asymmetric crown.
14 Fern pine	13	4	Yes	\$2,800	Good	Asymmetric crown.
15 Fern pine	7	2	No	\$350	Poor	Crown sheared, poor color.
16 Fern pine	7	2	No	\$350	Poor	Crown sheared, poor color.
17 European birch	5	2	No	\$150	Poor	Multi-stemmed at 6', dieback in upper crown.
18 European birch	8	2	No	\$300	Poor	Multi-stemmed at 6', dieback in upper crown.
19 Sweetgum	11	3	No	\$1,050	Moderate	Asymmetric crown.
20 Bradford pear	7	4	No	\$850	Good	Multi-stemmed at 7'.
21 Bradford pear	7	4	No	\$850	Good	Multi-stemmed at 7'.
22 Fern pine	16	3	Yes	\$3,000	Moderate	High, dense crown.
23 Bradford pear	6	4	No	\$650	Good	Multi-stemmed at 7'.

David Powers and Associates
Duave Avenue Site (Taylor Woodrow Project)
Sunnyvale CA
March 2006

TREE SPECIES No.	TRUNK DIAMETER (inches)	CONDITION 1=POOR 5=EXCELLENT	Protected TREE?	APPRAISED VALUE US\$	SUITABILITY FOR PRESERVATION	COMMENTS	
24	Monterey pine	28	2	Yes	\$1,100	Poor	Pitch moth, poor color.
25	Sweetgum	11	3	No	\$1,050	Moderate	Multi-stemmed at 8'.
26	Sweetgum	16	3	Yes	\$2,150	Moderate	Secondary trunk forms dominant leader.
27	Sweetgum	14	3	Yes	\$1,650	Moderate	Topped at 25'.
28	Sweetgum	14	3	Yes	\$1,650	Moderate	Secondary trunk forms dominant leader.
29	Sweetgum	12	3	Yes	\$1,250	Moderate	Multi-stemmed at 12'.
30	Sweetgum	10	4	No	\$1,200	Good	Good form and health.
31	Sweetgum	13	4	Yes	\$2,000	Good	Good form and health.
32	Bradford pear	5	4	No	\$450	Good	Multi-stemmed at 7'.
33	Sweetgum	13	4	Yes	\$2,000	Good	Was pruned to clear building.
34	Sweetgum	13	4	Yes	\$2,000	Good	Was pruned to clear building.
35	Sweetgum	14	4	Yes	\$2,350	Good	Multi-stemmed at 12'.
36	Fern pine	12	3	No	\$1,700	Moderate	Asymmetric crown.
37	Fern pine	13	3	No	\$2,000	Moderate	Asymmetric crown.
38	Fern pine	15	3	Yes	\$2,650	Moderate	Asymmetric crown.
39	European birch	10	3	No	\$750	Moderate	Asymmetric crown.
40	European birch	8	3	No	\$500	Moderate	Pruned to clear building.
41	European birch	8	3	No	\$500	Moderate	Leaning trunk.
42	Monterey pine	16	2	Yes	\$850	Poor	Poor color, branch dieback.
43	Crepe myrtle	5	4	No	\$200	Good	Multi-stemmed at 8'.
44	Crepe myrtle	5	4	No	\$200	Good	Multi-stemmed at 8'.
45	Crepe myrtle	5	4	No	\$200	Good	Multi-stemmed at 8'.
46	Crepe myrtle	5	4	No	\$200	Good	Multi-stemmed at 8'.

David Powers and Associates
Duave Avenue Site (Taylor Woodrow Project)
Sunnyvale CA
March 2006

TREE SPECIES	TRUNK	CONDITION	Protected	APPRAISED	SUITABILITY	COMMENTS	
No.	DIAMETER	1=POOR	TREE?	VALUE	FOR		
	(inches)	5=EXCELLENT		US\$	PRESERVATION		
47	Crepe myrtle	5	4	No	\$200	Good	Multi-stemmed at 8'.
48	Crepe myrtle	5	4	No	\$200	Good	Multi-stemmed at 8'.
49	Flowering plum	5,4,4,3	3	No	\$350	Moderate	Multi-stemmed at 3'.
50	Flowering plum	5,4,4	3	No	\$300	Moderate	Multi-stemmed at 3'.
51	Flowering plum	4,4,4,3	3	No	\$300	Moderate	Multi-stemmed at 3'.
52	Flowering plum	4,4,4,3	3	No	\$300	Moderate	Multi-stemmed at 3'.
53	Flowering plum	4,4,4	3	No	\$350	Moderate	Multi-stemmed at 3'.
54	Monterey pine	16	2	Yes	\$350	Poor	Pitch moth, Multi-stemmed at 12'.
55	Southern magnolia	23	4	Yes	\$6,600	Good	Moderate color.
56	Monterey pine	23	2	Yes	\$750	Poor	Leaning trunk, partial failure.
57	Blue atlas cedar	27	4	Yes	\$9,100	Good	Asymmetric crown.
58	Southern magnolia	10	3	No	\$950	Moderate	Multi-stemmed at 5'.
59	Fern pine	8	2	No	\$450	Poor	Sheared crown.
60	Fern pine	7	2	No	\$350	Poor	Sheared crown.
61	Fern pine	7,6	2	No	\$600	Poor	Sheared crown.
62	Fern pine	8	2	No	\$450	Poor	Sheared crown.
63	Fern pine	6	2	No	\$250	Poor	Sheared crown.
64	Fern pine	7	2	No	\$350	Poor	Sheared crown.
65	Flowering plum	6,3,2	3	No	\$250	Moderate	Multi-stemmed at 3'.
66	Flowering plum	5,4,3,3	3	No	\$300	Moderate	Multi-stemmed at 3'.
67	Flowering plum	5,4,4,3	3	No	\$350	Moderate	Multi-stemmed at 3'.
68	Flowering plum	5,4,3,2	3	No	\$300	Moderate	Multi-stemmed at 3'.
69	Flowering plum	5,4,4,3,2	3	No	\$350	Moderate	Multi-stemmed at 3'.

David Powers and Associates
Duave Avenue Site (Taylor Woodrow Project)
Sunnyvale CA
March 2006

TREE SPECIES No.	TRUNK DIAMETER (inches)	CONDITION 1=POOR 5=EXCELLENT	Protected TREE?	APPRAISED VALUE US\$	SUITABILITY FOR PRESERVATION	COMMENTS	
70	Flowering plum	6,5,5,4,3	3	No	\$600	Moderate	Multi-stemmed at 3'.
71	Flowering plum	6,6,4,4,3	3	No	\$600	Moderate	Multi-stemmed at 3'.
72	Flowering plum	3,3,3,2	3	No	\$150	Moderate	Multi-stemmed at 3'.
73	Flowering plum	5,5,3,2	3	No	\$350	Moderate	Multi-stemmed at 3'.
74	Flowering plum	4,4,4	3	No	\$250	Moderate	Multi-stemmed at 3'.
75	Flowering plum	4,3,3,2	3	No	\$200	Moderate	Multi-stemmed at 3'.
76	Crepe myrtle	5	4	No	\$200	Good	Multi-stemmed at 7'.
77	Crepe myrtle	5	4	No	\$200	Good	Multi-stemmed at 7'.
78	Crepe myrtle	5	4	No	\$200	Good	Multi-stemmed at 7'.
79	Crepe myrtle	5	4	No	\$200	Good	Multi-stemmed at 7'.
80	Crepe myrtle	5	4	No	\$200	Good	Multi-stemmed at 7'.
81	Crepe myrtle	5	4	No	\$200	Good	Multi-stemmed at 7'.
82	Southern magnolia	12,7,7	3	Yes	\$2,200	Moderate	Multi-stemmed at 4'.
83	Blue atlas cedar	15	3	No	\$2,050	Moderate	Narrow trunk attachment.
84	Bradford pear	6	2	No	\$250	Poor	Narrow trunk attachment.
85	Bradford pear	6	2	No	\$250	Poor	Multi-stemmed at 6'.
86	European birch	9,9	3	No	\$1,150	Moderate	Trunks are separate at base.
87	European birch	9,9,7	3	No	\$1,500	Moderate	Multi-stemmed at base.
88	European birch	9,9,8	4	No	\$2,250	Good	Multi-stemmed at base.
89	European birch	10,9,9	4	No	\$2,600	Good	Multi-stemmed at base.
90	European birch	17,11	4	Yes	\$4,000	Good	Multi-stemmed at base.
91	Australian willow	5	2	No	\$150	Poor	Leaning crown.
92	Australian willow	6,5,4,3,3	3	No	\$800	Moderate	Multi-stemmed at 3'.

David Powers and Associates
Duave Avenue Site (Taylor Woodrow Project)
Sunnyvale CA
March 2006

TREE SPECIES No.	TRUNK DIAMETER (inches)	CONDITION 1=POOR 5=EXCELLENT	Protected TREE?	APPRAISED VALUE US\$	SUITABILITY FOR PRESERVATION	COMMENTS	
93	Australian willow	12,8	3	Yes	\$1,750	Moderate	Multi-stemmed at 3'.
94	Australian willow	10	3	No	\$850	Moderate	Multi-stemmed at 6'.
95	Australian willow	6,6,6,5	3	No	\$1,150	Moderate	Multi-stemmed at 3'.
96	Australian willow	8	3	No	\$550	Moderate	Multi-stemmed at 5'.
97	Australian willow	7	3	No	\$450	Moderate	Multi-stemmed at 5'.
98	Australian willow	8,7,7	2	No	\$800	Poor	Branches dying back.
99	Australian willow	6,6,5,5,4,4	3	No	\$1,300	Moderate	Multi-stemmed at 3'.
100	Southern magnolia	10	4	No	\$1,350	Good	Multi-stemmed at 6'.
101	Lemon bottlebrush	7,5,4	3	No	\$850	Moderate	Multi-stemmed at base.
102	Lemon bottlebrush	6,6,4,2	3	No	\$850	Moderate	Multi-stemmed at base.
103	Lemon bottlebrush	6,5,5,3	3	No	\$900	Moderate	Multi-stemmed at base.
104	Lemon bottlebrush	6,6,5,4,2	3	No	\$1,100	Moderate	Multi-stemmed at base.
105	Lemon bottlebrush	5	3	No	\$250	Moderate	Leaning trunk.
106	Lemon bottlebrush	7,6,4,4,3	3	No	\$1,150	Moderate	Multi-stemmed at base.
107	Southern magnolia	10	4	No	\$1,350	Good	Asymmetric crown.
108	Lemon bottlebrush	6,4,4,3	3	No	\$700	Moderate	Multi-stemmed at base.
109	Lemon bottlebrush	8,5,5,5	3	No	\$1,300	Moderate	Multi-stemmed at base.
110	Lemon bottlebrush	8,6,6,5	3	No	\$1,450	Moderate	Multi-stemmed at base.
111	Southern magnolia	14	3	Yes	\$1,800	Moderate	Previously topped.
112	Southern magnolia	5	3	No	\$300	Moderate	Good form, poor color.
113	Southern magnolia	11,5	3	No	\$1,350	Moderate	Good form, poor color.
114	Southern magnolia	7	3	No	\$500	Moderate	Good form, poor color.

Tree Survey Map

Duane Avenue Site
Sunnyvale, CA

Prepared for:
David Powers and
Associates
San Jose, CA

March 2006



No Scale

Notes:
Base map provided by:
Google.com

Numbered tree locations
are approximate.

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